TAPE

Technology Assessment Protocol – Ecology

Guidance for Evaluating Emerging Stormwater Treatment Technologies

Background

- In 2002 the first TAPE guidance was published.
- In 2004 this guidance was updated.
- Ecology is currently working on a new update.

Stormwater Management Manuals

- Volume V, Chapter 12 of the Western Washington manual and Chapter 5, Section 12 of the Eastern Washington manual are devoted to emerging technologies.

- Since emerging technologies are rapidly evolving and it is not practical to update the SWMM every time a new device comes out, the TAPE was created.

- Devices will be included in future updates to the manual.

Purpose

TAPE Provides:

- **a testing protocol for evaluating emerging stormwater technologies.**
- **a process for reporting on the appropriate uses of the technologies.**
- **a process for reporting on the performance of emerging technologies.**

TAPE Provides:

- criteria for sizing emerging technologies.
- guidance to local governments who are asked to approve emerging technologies.

What are Emerging Stormwater Treatment Technologies?

TAPE most directly deals with:

- Innovative proprietary devices that treat stormwater.
- Also known as “black box” treatment systems.

The Technical Review Committee (TRC)

- Made up of local and governmental representatives
- Help Ecology review all submittals and make decisions regarding emerging technologies

The Tape Process

1. Conduct initial testing on the stormwater treatment device.

2. Submit an initial submittal packet to Ecology and the TRC chair.

3. Ecology and the TRC chair will review the initial submittal packet for completeness.

4. Submit initial submittal packet to Ecology and the TRC for review.

5. Ecology and the TRC review packet and decide on a use level designation.

6. Ecology issues a use level designation.

Step 1 – Initial Testing

- Financial burden of testing lies with manufacturer
- TAPE is not intended to be used for conducting research on experimental devices, devices must have performance data that demonstrates feasibility.
- Initial testing can be lab or field testing.

Step 2 – Initial Submittal

- Manufacturers submit a packet that contains performance claims, performance data, and a product description for review.

- Initial submittal must include what use level designation they would like to attain and in what treatment application.

Treatment Application Options

- Pretreatment
- Basic Treatment
- Enhanced Treatment
- Phosphorus Treatment
- Oil Treatment
- Retrofit
- Treatment Trains

☆ Treatment goals apply to the water quality design storm volume or flow rate and applies on an average annual basis to the entire annual discharge (treated plus bypasses).

Pretreatment

- Intended to achieve a goal of 50% removal of fine (50 micron size) particles or 80% removal of coarse (125 micron size) particles for influent concentrations between 100-200 mg/L. For concentrations less than 100 mg/L, effluent goals are 50 mg/L of fine particles and 20 mg/L of coarse particles.

- Used to extend performance of a downstream basic or enhanced treatment device.

- Used before infiltration.

Basic Treatment

- Intended to achieve a goal of 80% removal of total suspended solids for influent concetrations between 100-200 mg/L. Higher treatment is expected for influent concentrations greater than 200 mg/L. An effluent goal of 20 mg/L is expected for influent concentrations below 100 mg/L.

Enhanced Treatment

- Intended to achieve metals removal.
- Performance goals assume dissolved copper typically ranges from 0.003-0.02 mg/L and dissolved zinc ranges from 0.02-0.3 mg/L.
- Expected to achieve higher removal rates than basic treatment.

Phosphorus Treatment

- Intended to achieve a goal of 50% total phosphorus removal for a range of influent total phosphorus of 0.1-0.5 mg/L.

- Must achieve basic treatment goals as well.

Oil Treatment

- Goals of no ongoing or recurring visible sheen, and a daily average total petroleum hydrocarbon concentration no greater than 10 mg/L with a maximum of 15 mg/L for a grab sample.

Retrofit

- Not a treatment option that manufacturer would apply for.

- Devices should provide mostly coarse solids removal and improve the effectiveness of downstream treatment devices.

Treatment Train

- A treatment train is a combination of two or more basic treatment devices connected in series, or

- A combination of devices that can achieve one of the treatment goals.

Step 3 - Review of Initial Submittal

- Ecology and TRC chair check submittal for completeness and proper data.

- This is where manufacturer would be informed if they need to do further testing or a different type of testing.

Step 4 – Submission of Submittal to TRC and Ecology

- Ecology and TRC review submittal.

- In particular, the TRC makes sure that data is accurate and collected in a way that is in line with the TAPE protocol, that the device seems likely to work in Washington, and that the device is maintainable.

Step 5 – Ecology and TRC Review and Decide on a use level designation.

- Ecology and the TRC will review all submittals and decide on a use level designation.
- Use level designation include a description of how the device is to be used and how the device is to be sized.
- These can be found of the Ecology website at: http://www.ecy.wa.gov/programs/wq/stormwater/newtech/index.html

Step 6 - Ecology Issues a Use Level Designation

- Ecology issues one of three use level designations:
  - Pilot Use Level Designation
  - Conditional Use Level Designation
  - General Use Level Designation

Use Level Designations

- Based on quality and amount of performance data.

- Devices that have pilot and conditional use level designations and have been installed in the field will not be removed if it is found after more testing that the device does not perform as expected.

Pilot Use Level Designation (PLD)

- Allows for limited use to complete field testing.
- All devices put in the ground must be tested. Testing should be completed to obtain a general use level designation (GULD)
- Municipalities that have an NPDES permit must notify Ecology if they plan to use a PLD device

Conditional Use Level Designation

- Devices are already in use in Washington

- Field testing must be completed on some sites. Testing should be completed to obtain a general use level designation.

General Use Level Designation (GULD)

- General acceptance for the device.
- Device requires no more testing.
- Device can be used anywhere in Washington.
- Device will be added to future stormwater management manual updates.

Quality Assurance Project Plans and Technology Evaluation Engineering Reports

- Devices that have obtained a conditional use level designation or a pilot use level designation must submit a quality assurance project plan (QAPP) to Ecology. This explains how the manufacturer plans to test the device and describes the test site. Ecology and the TRC will review this document to make sure test plans coincide with what is expected in the TAPE. QAPPs must be submitted before startup of any new devices.

- Technology Evaluation Engineering Reports are the final reports that are submitted to Ecology. They include all data that has been collected during the use level designation period and should be used to finalize any performance claims made about the treatment device.

Chemical Technology Assessment Protocol Ecology CTAPE

- Similar to TAPE but deals with construction site stormwater treatment technologies which are mainly chemical treatment options.

Questions?

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